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LECISLATIVE AND INSTITUTIONAL ASPECTS OF WATER-RESOURCES MANAGEMENT

Institutional and legal issues in integrated water-resources management

Report of the Secretary-General

SUMMARY

The present report has been prepared in response to Economic and Social Council decision 1993/302 and the recommendation of the Committee on Natural Resources at its first session. The report addresses the increasing link between water legislation and economic and environmental issues, focusing mainly on water quality and pollution control. There is a growing awareness of the need for integrated and efficient water-resources planning, particularly river-basin and regional planning, as well as the need for greater coordination with planning for other natural resources, while taking economic and social objectives into account.

There is also a greater interest in developing appropriate information and guidance for policy makers, administrators, users, purveyors of water services and the general public. There have been important developments in conflict-solving as well as in prevention arrangements and procedures. There is a growing trend to involve the private sector and local governments in the provision of water-related services, the purveyors of which are closely monitored.

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There is, moreover, a concern to improve water allocation, for which water marketing is seen as an important mechanism. However, some authorities have indicated that marketing must be regulated to prevent undesirable environmental and social effects. The impact of subsidies on efficient allocation and sustainable water use is under increasing scrutiny. In many countries, the economic, environmental and social effects of water-related programmes, policies and projects are assessed before decisions are made. There is also a distinct trend to differentiate the institutional structures that deal with the planning, allocation and control of water resources from discrete operational activities and economic sectors. Water legislation and water management are affected by the need to improve the economic efficiency of water allocation and use in environmental and social settings in which market failures and external influences are common. Thus, economic flexibility may require greater accommodation with the environmental requirements and social concerns posed by sustainable development.

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INTRODUCTION

1. The present report on water legislation and institutional arrangements is submitted in compliance with Economic and Social Council decision 1993/302. The report identifies developments in water legislation in a number of countries. The institutional infrastructure for water management includes water policies; legal principles; organizational arrangements; and economic factors, elements and situations resulting from policy decisions and legal arrangements.

2. Although the report covers a wide range of issues, it does not purport to be exhaustive. There are important subjects that have not been dealt with due to limitations of time and space, including stakeholder and user participation, and the internal organization and minimum institutional requirements of organizations that deal with water planning and water-related services. The Committee may wish to request that a full report on those or other subjects be submitted to it at its next session.

3. Modern water legislation has considerably broadened the type and scope of issues to be considered in the regulation of water resources, in the following ways:

(a) There is a clear tendency to link water legislation to economic and environmental issues, with a strong emphasis on quality and pollution control;

(b) Special consideration is given to the international implications of domestic water legislation. Reference to international issues has been made in several water laws;

(c) Enforcement provisions have acquired greater relevance and some laws have addressed them in detail;

(d) There is a concern with integrated and efficient water-resources planning, particularly river-basin and regional planning. Water planning is coordinated with planning for other natural resources as well as with economic and social objectives. Planning includes water quality and quantity;

(e) Technology and research are specifically required by several laws;

(f) There is more concern to develop appropriate information and guidance for policy makers, administrators, users, purveyors of water services and the general public;

(g) Public participation is required in several legal arrangements.

4. There have been important developments in conflict resolution, prevention arrangements and procedures. In the past, conflicts were generally resolved by means of adversarial procedures. At present, legislation is also aiming to resolve conflicts by means of consultation, mediation, coordination, cooperation and inter-jurisdictional arrangements.

5. There is a definite trend to involve the private sector and local governments in the provision of water-related services. The purveyors of those services are closely monitored for, inter alia, the quality of their services, the environmental impact of their activities and their financial and economic status. Corporations providing water-related services are becoming global.

6. There is a concern to improve water allocation, for which water marketing is an important mechanism. However, some authorities have indicated that marketing must be regulated to prevent unwanted environmental and social effects. It has also been noticed that the performance of water markets depends on their particular location. The impact of subsidies on efficient allocation and sustainable use is under increasing scrutiny.

7. In many countries, the economic, environmental and social effects of water-related programmes, policies, and projects are assessed before decisions are made. The use, protection and planning of water resources is increasingly regulated by general environmental legislation.

8. There is a definite trend to differentiate the institutional structures that deal with the planning, allocation and control of water resources from discrete operational activities and economic sectors. However, sectoral needs in water planning and allocation must also be considered.

9. Water legislation and water management are affected by the need to improve the economic efficiency of water allocation and use in environmental and social settings in which market failures and external influences are common. This is best exemplified by two current trends in water management: the development of water markets, and an increased emphasis on water planning and regulation of externalities, both of which are needed. Thus, economic flexibility may require accommodation with the environmental requirements and social concerns posed by sustainable development.

I. WATER LEGISLATION

A. Water policies

10. Several countries state the purposes and objectives of their water policies in their water legislation. Such statements are relevant to the interpretation, application and enforcement of legislation.

11. Canada, in its Water Act of 1970, encouraged the optimal use of water resources for the benefit of all Canadians (art. 1). The federal Government can enter into agreements with the provinces with a view to preparing comprehensive water-resources management programmes (art. 4).

12. Germany, in its Water Law as amended on 23 September 1986, requested that water (both surface and groundwater) be managed in a manner that served the common interest, benefiting individual users while preventing avoidable harmful impacts (art. 1a).

13. The Netherlands, in its policy document on water management, 1/ established a policy of integrated water-resources management that included both the quantitative and the qualitative aspects of water management.

14. China, in its Water Law of 1988, aimed to ensure the rational development, utilization and protection of water resources, fully realizing the benefits of water for economic development and the livelihood of the population. Water is under public ownership, water rights are protected and the development and utilization of water resources is encouraged in the same manner as the control of water disasters (arts. 1-4).

B. Conditions of water use

15. There is a general trend to control the use of water by legislating such formal requirements as obtaining a permit and such substantive requirements as effective and beneficial use, no harm to third parties, environmental protection and efficiency).

16. Germany, in its Water Law as amended on 23 September 1986, attached a number of conditions to water use, permits and licences, including effective use, prevention of detrimental effects, payment of compensations, preventive assessment, appointment of caretakers, remedial measures and payment of common control costs (art. 4). A particular feature of the German legislation is the possibility of imposing new conditions even after a permit or license has been granted. Ex post facto conditions may apply to either the environmental or the economic requirements of water-resources management (art. 5). A water right can be revoked for non-use, lack of need, change of use by the permittee, use beyond the allocation under the permit etc. (art. 15). Permits are required for both withdrawing water and effecting discharges into it. However, as to the relationship between the Administration and a water user, a water right is not an entitlement to any specific water quantity or quality (art. 2). Applications can be rejected and permits and licences are granted for specific purposes, in a specific manner and to a specific extent, and are revocable (arts. 6 and 7). Use of water by property owners and riparians shall not adversely affect other persons, cause detrimental change to water, adversely alter water balance or substantially reduce water flows (art. 24).

17. China, in its Water Law of 1988, required that water uses, with certain exceptions, be subject to permit (art. 32); that the ratio of reuse be increased (art. 7); and that water uses not infringe upon public and third-party interests and rights, bearing in mind the requirements of flood control. Water development must consider the interests of different regions and of both upstream and downstream users. Domestic water demands are given priority. There is an express policy to encourage hydropower. Agricultural and industrial uses are also to be considered (arts. 12 to 16). Water supplied by projects and water withdrawals are subject to charges and fees (art. 34).

18. The United Kingdom of Great Britain and Northern Ireland, in its Water Resources Act of 1991, required a licence to abstract and impound water (sects. 24 and 25). Such licences must respect existing rights and privileges, and are subject to conditions and changes, including emergency variations and

revocation for non-payment of charges (sects. 57 and 58). In addition, the National Water Authority is empowered to design schemes for imposing water-resources and pollution-control charges; levies for flood defence; general and special drainage charges; fisheries charges or contributions; and navigation tolls (sects. 123, 131 to 144). In its Water Act of 1989, the country authorizes emergency measures at times of drought. Those measures include subjecting water uses to conditions and restrictions, prohibiting or limiting water takings, and suspending or varying authorizations (sects. 131 to 135). Other emergency measures concern information related to pollution incidents (sect. 119). The collection of charges for water applications and water licences is also provided for (sect. 129).

19. There are some systems in which water rights are not subjected to conditions of effective and beneficial use or there is no forfeiture of water rights for non-use. However, those systems contain a major requirement not to affect the rights of third parties. 2/

20. Conditions imposed on water use also act as mechanisms for demand management and water allocation. Thus, certain environmental requirements, such as minimum flows, are considered beneficial uses in a number of systems. The system of priorities guides the allocation of water and also the direction of funding for development. The pricing of water is a tool for both allocation and increased efficiency.

C. Quality controls and environmental concerns

21. As water becomes scarcer relative to demand, as externalities increase and as knowledge improves, the need to control the deterioration of water quality is translated into more detailed and demanding legislation. Permits, prohibitions and charges are used to curb the deterioration of water and related natural resources and environmental assets.

22. Canada, in its Water Act of 1970, limited the quantities of and the conditions under which waste could be disposed of in water-quality management areas. These conditions include the payment of fees (art. 8). There are provisions that allowed the prohibition and regulation of nutrients and will eventually allow the seizure of cleaning agents or conditioners that are manufactured in, or imported into Canada in violation of the law (sects. 18 to 20). The Act also provides for the designation of water-quality management areas and the implementation of water-quality management programmes (art. 11). Water-quality management agencies are responsible for planning, initiating and carrying out programmes to restore, preserve and enhance the quality of the water within their water-quality management areas (art. 13).

23. Germany, in its Water Law as amended on 23 September 1986, imposed a general duty to prevent water contamination and any detrimental changes of its properties, requiring an economical use of water in the interests of conserving natural water resources (art. 1a). Discharges into water are subject to maximum loads and technological requirements. Hazardous wastes must be treated using the best available technology (art. 7). The Länder are responsible for specifying the public corporations responsible for waste-water disposal, the

prerequisites of waste disposal and the plans according to which waste water will be managed, treated and disposed of (art. 18). The Länder may also establish lists of prohibited substances, effects to be prevented and minimum requirements to be fulfilled by disposal systems. There is provision for strict, joint and several liability resulting from damages caused by introducing or throwing any substances into water (art. 22). Discharges causing insignificant detrimental changes are to be allowed only when overriding public interest requires it. Water can be subject to characterization parameters issued by the federal Government (art. 36b). The law also provides for proper flow conditions, maintenance of navigation, ecological requirements, landscape features, protection of banks and self-purification (art. 27).

24. Germany, in its Act on Waste-Water Charges of 6 November 1990, provided for water charges to be paid for water pollution. Charges are based on noxiousness levels, which depend on oxidizable substances, phosphorous, nitrogen, mercury, cadmium, chromium, nickel, lead, copper and their compounds; and on toxicity to fish (arts. 1 to 3). They are also based on the classification of particular river basins and the number of units of noxiousness in the water body downstream of the river classification basin. Water charges are to be paid by anyone discharging waste water. The revenue resulting from water charges shall be used to finance measures to improve water quality (arts. 9 and 13).

25. The Netherlands, in its policies on environment and water, aimed primarily at ensuring and maintaining a safe and habitable country and developing and maintaining healthy water systems that guaranteed sustained use. 3/ Three so-called screens have been established: (a) reduction of pollution at the source; (b) hydraulic design; and (c) rational or guided use of water resources, in particular groundwater. Quality objectives and monitoring methods and procedures have been established. The system includes the licensing of discharges into water and, for specific industrial sectors, into sewers; the payment of pollution charges; and the preparation, every five years, of action plans to combat water pollution. 4/ The policies also address diffuse pollution, such as that caused by atmospheric deposition, tars utilized as protection materials for wooden shore and bank facilities, and agricultural run-off and leachates. Some pesticides have been absolutely prohibited, others are restricted and some are subject to application according to best environmental practices. Additional measures, intended to control environmentally negative effects, include friendly environmental design as well as sedimentation and eutrophication control. The costs of pollution control and environmental protection in the Netherlands are met either through the general budget financed by taxpayers or through a special budget financed with levies or charges raised from polluters.

26. The United Kingdom of Great Britain and Northern Ireland, in its Water Act of 1989, provided for the classification of water quality (sect. 104); the establishment of water-quality objectives (sect. 105); the control and remedy of pollution (sect. 107); protection from sedimentation and refuse or waste vegetation (sect. 109); protection against pollution (sect. 110); the creation of water-protection zones (sect. 111); the establishment of nitrate-sensitive areas (sect. 112); the establishment of minimum acceptable river flows (sect. 127); and the enactment of codes of good agricultural practices, with a view to protecting water resources (sect. 116). In its Water Resources Act of

1991, the United Kingdom imposed conservation and enhancement duties on its ministers and on the National Rivers Authority with a view to protecting amenities, flora, fauna, historical places and other environmental interests. Public access and public availability are also taken into account. Those duties are also to be considered when dealing with undertakers and their proposals for the management of waters and lands (sect. 16). Additional duties relate to environmental concerns for sites of special interest and for the enactment of codes of practice with respect to environmental and recreational duties (sects. 17 and 18).

27. China, in its Water Law of 1988, created a state duty to protect water resources and adopt effective measures for the protection of flora, conserve water sources, control soil and water losses and improve the ecological environment. Water pollution is to be prevented and controlled, with a view to protecting and improving water quality. Supervision and management of prevention and control of water pollution is to be strengthened. Water is to be conserved (arts. 5 to 7). Agriculture must be practised with a view to promoting stable and high agricultural yields (art. 15). Hydropower development is to be done in accordance with protection of the ecological environment (art. 16). Fish ladders must be constructed when needed (art. 18). Adverse environmental impacts resulting from the implementation of inter-basin transfers (art. 21) must be prevented. Additional rules control the disposal of refuse, mining activities, land reclamation, the protection of projects and the creation of management and safeguard zones (arts. 24 to 29).

28. The United States of America, in its Clean Water Act of 1972, regulated water quality to ensure that all waters received minimum protection. Individual states play a primary role in area-wide waste treatment and non-point pollution control and can also take over the enforcement and administration of the Act. The Act covers virtually all types of discharges into the waters of the United States of America and relies on water-quality standards and discharge permits tied to technological requirements for the treatment or elimination of different types of pollutants.

D. Enforcement provisions

29. As externalities become more common, grave and dangerous, the need for information, monitoring and remedial action is increasing. Water legislation has responded to that need through a variety of provisions.

30. Canada, in its Water Act of 1979, provided for the appointment of inspectors and analysts, who could enter places, facilities, premises and vehicles; examine waste, cleaning agents and water conditioners; examine containers; take samples; require information; and require and inspect books and documents. Inspectors are assisted in the performance of their functions. Obstruction of functions and false statements are prohibited (arts. 23 to 25). The Act also provides for fines, continuing offenses (each day to be considered a separate offence), issuance of refrain orders and other enforcement tools (arts. 28 to 35).

31. Germany, in its legislation, has provided for supervision of the equipment, facilities and processes relevant to water use. Such supervision includes rights of access and a requirement of information (art. 21).

32. The United Kingdom of Great Britain and Northern Ireland, in its Water Act of 1989, provided a comprehensive definition of the powers of the National Water Authority, including a general power to do everything incidental or conducive to the carrying out of its functions; fixing and recovering charges for services; instituting criminal proceedings; acquiring land; gaining entrance to premises; and taking samples (sect. 145). Additional powers include dealing with foul water and pollution, and carrying out works and surveys (sects. 154 to 165).

33. China, in its Water Law of 1988, required the cessation of unlawful activities, the removal of impediments and compensation for losses, within stipulated time-limits (arts. 44 and 45). Certain activities are fined, and functionaries and public officers are personally liable (art. 50).

34. The United States of America, in its Clean Water Act of 1972, provided for enforcement, including record-keeping; reporting; installing and using monitoring equipment; and sampling effluents. Records must be available to the public, except when they can be reasonably termed a trade secret. The Environmental Protection Agency has the authority to enter premises for inspection. Sanctions include notice of violation, administrative compliance and extension orders, civil actions, administrative penalties and criminal actions. The Administration can issue orders for administrative compliance, assess administrative penalties or initiate civil suits. Injunctions may be issued in cases of immediate, severe and proven threat to health. Criminal liability proceedings are instituted against responsible parties, including corporate officers, in cases of negligent or known violations. There are also provisions for acting in emergencies. The Act authorizes citizens' suits and contains a strict liability provision (sect. 311).

E. Protection and management of water supplies

35. The protection of water sources has been a traditional concern of water law. Increasing demand and externalities have strengthened this concern.

36. Germany, in its Water Law as amended on 23 September 1986, provided for the creation of water protection areas within which certain activities could not take place or certain measures must be tolerated (art. 19). The law requires the licensing of pipeline systems conveying substances constituting a hazard to water. Such licences are subject to conditions that can be changed even after a licence has been issued (art. 19). The use of and discharges into groundwater are subject to permit and licensing (arts. 32 and 34).

37. Groundwater is increasingly controlled and protected. A number of countries have enacted legislation that requires permits, creates administrative devices to control the use of groundwater in special management areas and restricts the expansion of high consumption activities such as irrigation. Management measures include the issuance of certifications of assured water supplies, which are required for the approval of subdivision plats; the

registration and recording of wells; the control of water storage and recovery; the control of well drillers; the protection of pre-existing uses; the use of groundwater charges; the measurement of withdrawals; estimations of supply and demand; stopping and reducing withdrawals in order to allow replenishment; granting emergency powers in case of drought; granting permits at the discretion of water administrators (except in cases of clear abuse of discretion); deadlines for waterworks and activities; monitoring; the possibility of amending and forfeiting water rights (previous hearing); the conjunctive use of surface and groundwater; the control of discharges into groundwater; and allocation of groundwater to preferred uses, such as drinking water supply. 5/ China provides for groundwater management and conjunctive use (art. 25).

38. The United Kingdom of Great Britain and Northern Ireland, in its Water Resources Act of 1991, provided that the National Rivers Authority should have a general mandate of proper management, including conserving, redistributing, augmenting and securing the proper use of the water supplies of England and Wales. Water-resources management schemes can be entered into for this purpose.

F. Conciliation of interests

39. Governments are resorting to conciliation mechanisms and preventive strategies in order to manage water-related differences and coordinate activities with a view to achieving the several objectives and satisfying the many demands that are usually associated with water resources.

40. The federal Government and the states of Australia signed an "Intergovernmental Agreement on the Environment" on 1 May 1992. The Agreement intends to provide a cooperative national approach to the environment; a better definition of the role of the respective governments; a reduction in the number of disputes; greater certainty; and better environmental protection. The Agreement acknowledges the role of state governments in developing national and international policies; the global character of environmental concerns; the need for ecologically sustainable development; the need to conserve and improve biota, soil and water resources; the relationship between efficiency and a clear definition of the roles of different levels of government; the need to have explicit accounts of costs and benefits; the relationship between effectiveness and cooperation; and the need for accountability.

41. The Agreement determines the responsibilities and interests that are common to all levels of government, as well as those that are the concern of specific levels of government (the commonwealth, the states, the local governments). It also states procedures for the accommodation of interests. Decision-making must include economic as well as environmental considerations, since strong, growing and diversified economies enhance the capacity for environmental protection; must apply the precautionary principle; must seek intergenerational equity; and must conserve biological diversity and ecological integrity. The "polluter pays" and "consumer pays" principles are endorsed. The schedules to the Agreement concern, inter alia, data collection and handling; resource assessment; land-use decisions and approval processes; environmental impact assessment; national environmental protection measures; climate change; biological diversity; national state; world heritage; and nature conservation.

42. Germany, in its Water Law as amended on 23 September 1986, provided for the reconciliation of rights and authorizations to use water when either the qualities or the quantities of existing supplies did not allow the satisfaction of all uses. Compensation can be paid (art. 18).

43. China, in its Water Law of 1988, provided for the settlement of disputes among districts through consultations, in a spirit of mutual understanding and accommodation, solidarity and cooperation. Only after consultation fails are disputes referred to the next level of government. Projects cannot be implemented while a dispute remains unsettled unless there is an agreement between the parties or an approval is granted by the next higher level of government (art. 35). Disputes between units, between units and individuals, or between individuals are to be resolved through consultations and mediation. Failing agreement on mediation and consultation, or if those are not successful, the dispute can be referred to adjudication by either the Administration or a court. Administrative decisions can be referred to a court when a party refuses to accept the administrative decision (art. 36). The water regime cannot be unilaterally altered pending a decision but temporary measures can be authorized by the Government.

44. Canada, in its Water Act of 1970, established a system of agreements between the federal Government and the provinces for the management of any waters where there were significant national interests. Programmes can be created to develop inventories of water resources; provide data; formulate comprehensive water-resources management plans; design projects for the efficient conservation, development and utilization of waters; and implement other plans and programmes (art. 4). In certain circumstances, such programmes can be undertaken directly by the federal Government (art. 5). Agreements cover, inter alia, the responsibilities of the parties; the allocation of costs and the terms of payment; the provision of labour, land and materials to be made by each party; the proportion of any compensations to be paid by each party; the conditions of loans, if any; the responsible authorities; and the general terms and conditions of the programme. There are also references to the conditions of the boards, commissions or other bodies to be created under the agreement, where applicable (art. 7). Water-quality management agreements are also provided for (art. 9). Under certain circumstances, the federal Government can create federal water-quality management programmes for inter-jurisdictional waters (art. 11).

G. Concern for international issues

45. Growing scarcity, competing demands and transfer of externalities occur not only within national boundaries but also at the international level. In addition, in common market areas differing regulations might either curb imports or give a competitive advantage to exports. Trends to privatize water-related services in many countries have, moreover, led to international opportunities for provision of advice, equipment and services.

46. Therefore, countries are increasingly referring to extraterritorial factors or elements in their national water legislation.

47. Germany, in its Water Law as amended on 23 September 1986, provided for the refusal of pipeline licences if there were concerns about parts of the pipeline that were constructed or operated outside the area of application of the Law (art. 19). Specific water-management schemes will be drawn up in order to fulfil international obligations (art. 36b).

48. The United Kingdom of Great Britain and Northern Ireland, in its Water Act of 1989, authorized the National Water Authority to provide international assistance, training and advice (sect. 144). The appropriate minister is granted powers to issue regulations to give effect to any community obligation and to any international agreement to which the United Kingdom is, for the time being, a party (sect. 171). The activities of water-service companies are affected by the requirements of directives of the European Community, such as those concerning drinking and bathing waters.

49. China, in its water legislation, provides for the possibility of conflict between national water law and treaties to which China is a party. In such cases, the provisions of international treaties or agreements are to prevail (art. 51).

50. Canada, in its Water Act of 1970, authorized the federal Government to directly undertake the formulation of plans and the design of projects, including implementation, with respect to any international or boundary waters where there was a significant national interest in such plans or programmes (art. 5).

H. Technical requirements

51. As water becomes scarcer in relation to demand and more vulnerable to environmental attacks, legislation tends to introduce specific technical requirements for the use and protection of water. Some countries have introduced legislation supporting the development of appropriate technologies.

52. Germany, in its Water Law as amended on 23 September 1986, provided for technical requirements, inter alia, in relation to pollution control (art. 7); construction and operation of waste-water facilities (art. 18); construction and operation of pipeline systems (art. 19); and facilities handling hazardous substances (art. 19q). It also provided for specialist firms (art. 191) and for the use of the most advanced scientific techniques in establishing procedures to measure the level of noxiousness of waste water and pollutants (Act on Waste-Water Charges of 6 November 1990, art. 3(4)).

53. Regulations concerning the implementation of the principles of "emission reduction" and "standstill", which are set out in the policies for pollution control of the Government of the Netherlands, are closely related to technological requirements. Thus, industries should select processes and conduct operations according to the principle of good housekeeping. For blacklisted substances, control must involve the use of the best technical means available. The objective is a zero-discharge situation. Hazardous substances not included in the blacklist should be controlled using the best practicable means. Continual improvement of technical means, including the removal of

organic micropollutants, accidental spills and nutrients, is taken into account. 6/

54. The United Kingdom of Great Britain and Northern Ireland, in its Water Act of 1989, endowed the National Water Authority with the responsibility for carrying out research and related activities in areas related to its functions, including collating and publishing information relevant to the determination of water supply and demand in England and Wales. Similar activities may be undertaken outside England and Wales (sect. 143).

55. China, in its Water Law of 1988, promoted comprehensive scientific investigation, survey and assessment in the development and utilization of water resources. Outstanding scientific and technical research is to be rewarded (arts. 8 and 10). All units of government shall adopt advanced technology in water conservation, reduce water consumption and raise the ratio of water reuse (art. 7). China also requires compliance with technical standards in the construction of waterworks (sect. 19).

I. Water planning

56. The development of water resources is no longer amenable to isolated action. Water legislation is rapidly evolving towards integrated water planning in order to satisfy environmental objectives, economic requirements and social concerns.

57. Germany, in its water legislation, requires a prior plan approval procedure before approving any substantial modifications of water bodies and their shores (art. 31). River basins and economic regions are to be subject to water plans in order to safeguard the water resources needed for economic improvement and protection of the quality of life. Plans must consider available water resources, flood control and protection against pollution, and must integrate water planning with regional planning. They are to be produced by the Länder according to federal directives (art. 36). Water-management schemes, also to be produced by the Länder, are to consider the role of water within ecosystems, the rational use of groundwater and the requirements of different uses (art. 36b). Plans are subject to adjustment and updating. They are implemented through a variety of means, including administrative requirements and the revocation of permits and licences (art. 36b).

58. The river basin and the region are increasingly the focus of water management, development and protection. In 1974, water in the United Kingdom of Great Britain and Northern Ireland was regionalized. Later, the provision of water-related services was privatized. 7/ The functions of the water authorities in relation to flood control, water pollution, the management of water resources, land drainage, salmon and freshwater fisheries, and navigation and recreation, were transferred to the National Rivers Authority. 8/ The Authority consults with and has the duty to consider representations of regional rivers advisory committees. 9/ Legislation also provides for the creation of regional flood defence committees and regional freshwater fisheries committees. 10/

59. In Europe, there is a trend to implement a double level of water-resources management: a regional level for water-basin plans, legal enforcement and incentive policies, and a local level for the operation of services and the implementation of innovative policies such as urban hydrology. 11/

60. While the role of regional and basin planning, control and management has been strengthened in Europe, the lack of adequate mechanisms for intersectoral planning and coordination at basin level seems to be negatively affecting water management in some countries. 12/

61. China, in its Water Law of 1988, required that the development and utilization of water and the prevention of disasters be planned in a comprehensive and systematic manner, with all relevant matters taken into account for multi-purpose development and maximum benefits, allowing full consideration of the many different functions of water (art. 4). Water allocation is to be planned (art. 7). Development and utilization of water, and control of disasters, are to be based on overall planning, with rivers or regions as basic units. There are comprehensive plans for the basins of major rivers and specialized plans for individual sectors. Comprehensive plans are to be coordinated with the National Land Plan and are to consider the demands of different regions and sectors. They are prepared by the departments of water resources at the different levels of government. Specialized plans are sectoral and are to be prepared by the departments concerned (art. 11). Remedial measures or compensation are required in cases of interference with existing developments (art. 20). Consultations are required for projects with intersectoral or interregional impacts (art. 22). There are provisions for the relocation of populations displaced by water projects (art. 23).

62. China, in its Water Law of 1988, also required that all levels of government take effective measures for flood control. Special administrative units are responsible for that activity, so-called flood control headquarters, which have the authority to requisition materials, equipment and manpower, subject to return after the emergency or compensation. Flood defence plans are to be integrated into river basin plans (principle: "ensuring the keys while taking the generals into account"). Land use is subject to the needs of flood control and protection. The traditional principles prohibiting the blockage of water (by downstream units or users) or the aggravation of risk by increasing the discharge (on the part of upstream units or users) are applied. Emergency measures are to be adopted and implemented according to plans, and cover, inter alia, safety, protection, evacuation, livelihood, rehabilitation and compensation for losses (arts. 38 to 43).

II. MARKETING AND SUBSIDIES

63. Marketing arrangements for water-related products, subsidies and water-rights markets are particularly relevant issues, all of which are receiving increased attention.

A. Markets for water-related outputs

64. It has been noted that investments to improve the efficiency of the use of irrigation water are related not only to water pricing but also to the economic benefits resulting from improved management and yields (in terms of output). 13/ Such economic benefits result from the existence of markets (effective demand) for the outputs of irrigation.

B. Water subsidies

65. It has been found that subsidizing water for some activities and types of use causes an unnatural excess of demand, with impacts on water use, the environment and water reserves. Some countries are considering and implementing legislation to lower subsidies to irrigation water. 14/ In at least one case, the lowering of subsidies has been prompted by water scarcity, the need to improve efficiency, and increased coordinated activities of interests other than agriculture (business, urban, environment). 15/ In some arid areas, new policies are emerging that advocate, inter alia, marketing water rights, reallocating water to higher value uses and seeking development alternatives that rely less on water. 16/

66. In at least one court case, an environmental impact assessment of environmental subsidies in irrigation has been requested. A federal judge in California ordered an environmental review of rules limiting the number of acres farmers in the western United States of America could irrigate with federally subsidized water. The Bureau of Reclamation is to study the effects of a set of rules and regulations that it enacted in 1987 to put into effect the Reclamation Reform Act of 1982. The rules were challenged by environmental groups, which argued that the rules allowed large farms to continue using subsidized water, defeating the purpose of the reclamation project, which was to provide cheap water to family farms and did not properly assess their environmental impact. The Reclamation Policy of 1902 had provided water below market prices with a view to increasing agricultural output and encouraging the creation of family farms. Leasing arrangements and other devices had been used to bypass the limitations on acreage, which were intended to promote family farming, so that subsidies had in fact been granted to very large farming operations. The 1982 Act had required that water provided to agricultural holdings exceeding the legal limit be provided at full cost. The Bureau of Reclamation subsequently enacted regulations to implement the Act. Those regulations were found to have no significant impact, however, and were therefore not subjected to environmental impact assessment. That finding was challenged by the court, which found that the regulations were a major federal action with a potential to significantly affect the human environment. The court objected to the use of purely economic notions, such as rational utility maximizer, which it found theoretical, far removed from reality and in violation of the regulations, which require an interdisciplinary approach. An environmental impact review was therefore requested. 17/

C. Marketing water rights

67. Water-rights markets are increasingly being considered as a policy alternative to encourage the optimal use of scarce water resources. They also provide a means of postponing the development of costly new supplies. Water markets are a distinctive characteristic of water use in the western United States of America.

68. In Colorado, Nevada and Utah, water rights can be sold and bought separately from land. In other states, such as Arizona, water is acquired as an appurtenance to land. The reallocation of water rights, with the possible exception of water quality, may be the most pressing matter facing the arid west. 18/ For a reallocation to occur, water rights must have been beneficially used and must continue to be beneficially used after the reallocation. Such reallocation must not affect other users and must be in the public interest. In many jurisdictions, inter-basin transfers or transfer outside the area of origin can only take place after due consideration of local interests. In some jurisdictions, appurtenance statutes prevent water reallocation. 19/ The marketing of water rights is affected by the priority of the transacted right, the profile of the parties, geographic flexibility, the size of the transaction, dates, the reliability of water rights, flexibility in purpose and place of use, buyer characteristics, the volume of water transferred, changes in regional economies etc. 20/

69. While water-rights markets are strongly advocated by most reputable experts, some have reservations. Conflicts over water transfers are occurring in the western United States of America as large cities seek water supplies in rural areas. The public values at stake include the economic development of urban areas and the culture, way of life, environment and future of rural communities built around agricultural uses. It is becoming increasingly apparent that current water law and water market oriented behaviour are incapable of solving the conflict in an equitable manner. 21/ Therefore, according to some authorities, oversight and regulatory approval for water transfers and markets is required. 22/

70. Water markets in developing countries are still incipient. However, there are some experiences worth bringing to the attention of the Committee. In a 1981 law, Chile authorized water transfers and the marketing of water rights (arts. 6 and 21). The marketing of water rights has also been endorsed by Peru in a draft water law (arts. 26 to 29). Early assessments of the performance of the marketing of water rights in Chile indicate that market mechanisms within the research area may not have been fully operational due to difficulties in assigning a value to water rights and also due to some constraints in the institutional environment; water transactions have been quite limited. 23/

71. The lack of effective operation of market mechanisms has been attributed to constraints or transaction costs, including the rigidity of irrigation systems; the lack of storage capacity; the uncoordinated and outdated titling system; lack of legal knowledge; and cultural resistance. In addition, the market and legal systems do not have penalties for inefficient, inadequate or non-effective use of water rights: water rights are free of charge and there are no sanctions for lack of use. In contrast, in the western United States of America, there is

a requirement for effective and beneficial use of water, which is the cornerstone of the system.

72. Accordingly, market incentives for water transactions may not in fact have encouraged efficiency in the use of water in Chile. The investments that have taken place may have been prompted by expected gains resulting from the yields of water use. It has been noted that increased investments in irrigation might be due to the legislation of subsidies for irrigation development (law 18. 450/1985). That legislation authorized subsidies for up to 75 per cent of investments for a period of eight years (art. 1). There have also been questions concerning the equity of the system. It has been found that the impact might have been negative, since small and medium-sized farmers did not have adequate information or enough resources to take full advantage of the system. Low-income farmers did not in fact benefit from the system. If they had rights, they often lost them because they did not know what to do to protect them; if they did not have water rights, they did not obtain new rights because they did not know what to do to obtain them. 24/ The issue of distribution has also been considered by the World Bank, in its First Annual Report on the Environment and its working paper entitled "Allocation, distribution and scale as determinants of environmental degradation". 25/

III. FUNCTIONAL ORGANIZATION AND ADMINISTRATION

A. Vesting responsibility for overall water management

73. The functional organization of policy-making, water allocation, water management and the monitoring of users plays an important role in the implementation of a sustainable water development system. Where such functions are vested in institutions with functional responsibilities for specific water uses or discrete economic activities, water planning and management might not be objective. In such cases, each concerned party might tend to support projects or allocation of waters according to vested functional interests, without regard to the source of supply or the soundness of investments and projects.

74. To avoid such problems, many jurisdictions have allocated responsibility for policy-making, water allocation and programme and project evaluation to a non-user-agency or ministry. A recent publication of the World Bank emphasizes the need to separate policy, planning and regulatory functions from operational functions at each level of government. In so doing, the Bank agrees with the National Water Commission of the United States of America, which in 1972 was already recommending that policy planning and sectoral planning must be separated from functional planning, design and construction, as well as from operation by action agencies. 26/

75. In a majority of states in the United States of America, water planning and allocation are separate from functional, discrete and sectoral activities. However, in Kansas, the Division of Water Resources is under the authority of the State Board of Agriculture. In most states, water use is regulated by organizations dealing with either natural resources, the environment or water resources as a separate entity. 27/ A similar pattern is found in Canada and its provinces. 28/

76. Some Middle Eastern countries, such as Oman, have created ministries of water resources in an effort to improve the management of scarce and imperiled water resources. Such ministries are separate from functional, sectoral water activities, their main function being overall water management. 29/ Other Middle Eastern countries, such as Yemen, are at present considering the adjustment of their institutional systems to the needs posed by adequate water resources management. A Yemeni authority states that responsibility for water management at the national level is to be delegated not to a water-using sector but to a central independent authority. 30/

77. In Israel, the Ministry of the Environment has partial authority over the Water Commission and is responsible for the application and enforcement of the water-pollution mitigation provisions of the water law. 31/ Hungary has created a Ministry of Environment and Water Resources.

78. Changes in the European context include the reorganization of water management in the United Kingdom of Great Britain and Northern Ireland, which has separated water services from planning, control and regulation. Water services are produced by private limited companies, while water management and control are the responsibility of such public organizations as the National Rivers Authority and the Office of Water Services. 8/, 32/

79. China, in its Water Law of 1988, entrusted national long-term water planning to the Ministry of Water Resources. The Ministry was created as a response to the problems created by a fragmented institutional system, in which water had been managed by sectoral ministries, including the ministries of agriculture, industry, communication and construction. That fragmented use-oriented institutional system had resulted in imbalances between supply and demand, water pollution, reduced flood-discharging capacities, overdraft of groundwater, intractable and protracted water disputes and ecological deterioration. Water resources units have also been created at the local level. 33/

80. In the Netherlands, the central Government manages the most important surface waters (State waters) and determines the general policy, while local authorities and public bodies are responsible for regional waters, drinking-water supply, sewer systems and municipal waste-water treatment. There is a process for transferring functions to the regional level (police power and planning) as a tool for fostering a more integrated approach to water-resources management. Therefore, water planning in the Netherlands is a multi-party process that includes the central, regional and local levels of government for both surface water and groundwater, and quantitative and qualitative matters. 34/

81. Guatemala recently created a Water Resources secretariat, which has overall responsibilities for water planning and policy-making. Brazil is considering the implementation of a national water management system, which would include a national water resources council responsible for national water policy; the arbitration of conflicts; national water planning; amendments to water legislation; and other functions. The system is still under consideration and is being devised to satisfy a constitutional mandate. The main purpose of the process is to overcome the traditional conflicts and limitations imposed by a

system in which main water sectors have so far been entrusted to different functional ministries, thus fragmenting water management. The proposed system relies mainly on the river basin as the appropriate unit for water management. 35/

B. Transferring services to the private sector

82. There is also a trend to transfer responsibility for water-related services to provincial and local levels of government and the private sector. A main point to note in that regard is that transfers might not be successful if they are not accompanied by adequate economic and financial resources at provincial and local levels.

83. The United Kingdom of Great Britain and Northern Ireland has transferred water supply and sewerage to private-sector limited companies. Principles applicable to private undertakers have resulted, inter alia, from that country's Water Act of 1989, its Water Industry Act of 1991 and its Water Resources Act of 1991. The transfer was a complex process involving technical, institutional, economic and financial considerations. Regulatory bodies were created, separating regulation and policy from operations and undertakers. The purposes of the regulators are to assure that drinking water supply and sewerage are properly carried out; that undertakers are able to finance the proper carrying out of their functions; that the interests of customers are protected (charges, supplies and quality of services); and that services are economically and efficiently provided under conditions of effective competition. There is, therefore, a very distinctive concern for the financial and technical qualifications of water and sewerage undertakers. The system must fulfil certain duties in relation to environmental and recreational objectives. Water must be wholesome at the time of supply; if not, there are provisions for enforcement action. Sewerage systems are subject to special pollution and quality regulations. Charges are regulated in the conditions of the appointment of each undertaker. There are provisions for the appointment of special administrators in order to assure the continuity of the services provided by companies undergoing difficulties. The stock of the companies is subject to quotas, which assures on the one hand a minimum of coherence and on the other an acceptable level of widespread public ownership. Some shares can only be held by the public sector in order to represent certain public interests. 36/ There are also rules on the metering of water services.

84. Concerns about the technical and financial qualifications of purveyors of water services are clearly exemplified by the regulations in force in the State of New York in the United States of America. As a principle, services must be safe and adequate; must charge just and reasonable rates; and must operate without unjust discrimination and unreasonable preferences. Metering is considered to be instrumental in securing adequate water supplies, protecting the resource base and maintaining high standards of public health. The system allows differential charges for different manners, places, times and magnitudes of use. It contains detailed provisions on the financial and economic practices of public utilities providing water-related services. Financial monitoring covers charges, control of stock, bonds and loans. Financial rules also determine the purposes for which a utility can incur debt, regulate the

ownership of stock within public utilities and control the transfer of property. It is considered that the solvency of public utilities is clearly related to their ability to provide the public services under their responsibility. 37/

85. The movement towards decentralization and privatization of services has resulted in worldwide opportunities for companies specializing in drinking-water supply and sanitation services. Thus, an international consortium has recently won the privatization bid of Obras Sanitarias de la Nación in Argentina. The objectives of the process are to guarantee the maintenance and expansion of drinking-water supply and sanitation services; to assure the continuity and quality of the services; to protect the rights of the users; to assure an adequate regimen of operation; and to protect public health, water resources and the environment. The provision of the services is monitored by a regulatory commission, the members of which have a guaranteed term of tenure. Undertakers have to have proven experience and technical and financial capacity. Metering is requested for non-residential uses and block deliveries. Prices and tariffs must reflect the economic cost of providing the service, allowing benefits for the undertaker, including expansion costs, and assuring operation and maintenance. The tariff allows cross-subsidies. There are provisions on competent jurisdiction (the federal courts) and on the use of arbitration and mediation.

C. Assessment of water projects and programmes

86. The soundness of investments in water-related projects, programmes and uses is significantly enhanced if investments are made subject to both a compulsory assessment of economic, social and environmental feasibility and a sustainability analysis.

87. The National Water Resources Council of the United States of America has prepared a number of proposed principles and standards for planning water and related land resources, which provide a good example of a multidisciplinary assessment of water plans. The principles call for the implementation of a system to display the relevant beneficial or adverse effects of water plans. Consequently, water planning is to be assessed according to the effects that alternative plans might have on objectives of national economic development, environmental quality, regional development and social matters. 38/

88. The United States of America, in its National Environmental Protection Act of 1969, required that federal agencies include an environmental impact statement for every major federal action significantly affecting the quality of the human environment. The Act has been used to bring water-related cases to the courts (concerning dam and reservoir construction, dredge and fill, flood control, ocean dumping, rivers and harbours projects, and wetlands and water pollution).

89. In the Netherlands, activities requiring environmental impact statements include discharges into surface and groundwater; interfering with the groundwater table; the construction, widening or deepening of navigable waterways; diverting navigable natural waterways; the construction of naval

ports; the construction of main water pipelines; the construction of marinas, dykes and dams; land reclamation; and the construction of water reservoirs. 39/

90. The European Community, in directive 85/337/EEC, required environmental impact statements for trading ports and inland waterways. In the United Kingdom of Great Britain and Northern Ireland, new manufacturing plants discharging into water with the consent of the water authority might be required to produce an environmental impact statement. 40/

91. In its procedures for preparing environmental impact statements, Norway requires that all major physical developments be assessed for possible impacts on the environment, natural resources and society. 41/ Some countries have established types of areas within which projects or programmes are presumed to have significant environmental effects. In Finland, such areas include a number of areas protected by the Wild and Scenic Rivers Conservation Act as well as groundwater protection areas. The criterion of sensitive areas is also utilized in land planning. Poland has identified the disturbance of water regime and intakes as one of the factors likely to produce environmental disturbance. 42/

92. Canada, in its Environmental Assessment Act of 1992, aimed to ensure that the environmental effects of projects were carefully considered; that sustainable development was promoted for a healthy environment and a healthy economy; that projects did not cause significant adverse environmental effects; and that the public participated. The projects to be assessed include those proposed or financially assisted by the federal agencies; those that involve lands administered by federal agencies; or those that require permits, licences, approvals or enabling actions of federal agencies (art. 5). Therefore, the Act applies to projects in which the federal Government has a decision-making authority. Assessments are to be carried out as early as possible (art. 11). The Act is to be implemented through four regulations: the Inclusion List (physical activities); the Exclusion List (insignificant environmental effects); the Law List (functions, powers and duties whose exercise requires assessment); and the Comprehensive Study List (significant environmental effects). The Law List includes several water-related enactments, such as the Navigable Waters Protection Act and the International Rivers Improvement Regulations.

93. The Comprehensive Study List includes water-related activities, such as dams in national parks and protected areas; hydroelectric generating stations with more than 300 megawatts of production capacity; certain categories of water projects; offshore oil, gas and minerals projects; and certain transportation facilities.

D. Information, records, mapping

94. To be effective, a system for the planning and management of water resources must be able to provide information on the nature and quality of water, where it is available, who is using it and what they are using it for. Therefore, effective water-management systems require adequate official surveys, inventories and cadastres of water sources and water-supplies; they also require up-to-date registers and records of water uses and discharges into waters, water

rights and the beneficiaries of such rights, with their respective water allocations.

95. Germany, in its Water Law as amended on 23 September 1986, required the registration of water rights within a determined period of time. Lack of registration may result in the forfeiture of non-recorded rights (art. 16). The Register is to record permits and licences; existing rights and authorities; water-protection areas; and flood plains (art. 37).

96. The United Kingdom of Great Britain and Northern Ireland, in its Water Law of 1989, provided for registers with notices of water-quality objectives, applications, consents, certifications, water samples etc. The registers are to be available for inspection by the public free of charge. Members of the public can obtain copies of entries for a reasonable fee (sect. 117). In its legislation, the United Kingdom also requires that the National Water Authority and every water undertaker keep records of underground works and maps of water mains and sewers, and that such information be made available to the public free of charge (sect. 165). In its Water Resources Act of 1991, the United Kingdom created registers of abstraction and impoundment licences, pollution control and discharge works, as well as mapping systems of freshwater limits, main rivers and waterworks (sects. 191 to 195).

97. The objective of providing such information is to allow informed decisions by policy makers, administrators, managers, users and the public. Therefore, legislation requiring the submission of information by managers to policy makers, users and the public, and by users and the public to managers, is distinctive of modern water law. In its Water Resources Act of 1991, the United Kingdom required the National Rivers Authority to provide information to policy makers and undertakers, as well as to the public (sects. 196 to 197). The Authority, in turn, has powers to obtain information about surface water and groundwater. Information is to be timely and adequate and there are provisions on the kind of information to be collected and the manner in which the information must be organized (sects. 197 to 203). The system is complemented with norms on confidential and reserved information and penalties for false statements (sects. 205 and 206). Public participation is sought through a system of enquiries (sects. 213 to 215).

98. Canada, in its Water Act of 1970, set up public information programmes under which the public is informed about water conservation, development and utilization (art. 27). The Act also requires that the minister responsible for water inform the Parliament each fiscal year of the operations carried out under the Act (art. 36).

Notes

1/ "Water management in the Netherlands: policy, measures, funding" (November 1991), p. 4.

2/ Código de Aguas de Chile, ed. oficial (Dic. 408/1988) and Proyecto de Código de Aguas para el Perú (1993).

3/ "Water management in the Netherlands ...", p. 5.

4/ Ibid., pp. 8-9.

5/ Space limitations prevent a full listing of laws and countries in the text. For more detailed information about current practices in groundwater management, see Robert E. Beck, ed., Water and Water Rights (Charlottesville, the Michie Company, 1991); and Economic Commission for Europe, "Groundwater legislation in the ECE region" (ECE/WATER/44).

6/ "Water management in the Netherlands ...", pp. 9-10.

7/ Bernard Barraque, "Water resources management in Europe: beyond the privatization debate", Flux (Paris), January-March 1992, p. 9.

8/ Government of the United Kingdom of Great Britain and Northern Ireland, Laws of England, 4th ed., suppl., vol. 49, paras. 201-218, p. 49/6.

9/ Government of the United Kingdom of Great Britain and Northern Ireland, Water Act of 1989, sect. 2.

10/ Government of the United Kingdom of Great Britain and Northern Ireland, Water Act of 1989, sects. 136, 137 and 141, and Water Resources Act of 1991, sects. 6 to 14.

11/ Barraque, op. cit., p. 22.

12/ Carl J. Bauer, "Derechos de propiedad y el mercado en una institucionalidad neoliberal: efectos e implicancias del código chilena de aguas de 1981" (Santiago, August 1993), pp. 3-4.

13/ Bauer, op. cit., p. 2.

14/ Ilter Turan, "Politics of water and the role of international organizations: the Middle East", in Proceedings of the International Symposium on Water Resources in the Middle East: Policy and Institutional Aspects (Urbana, Illinois, 1993), p. 152; Henry Kamm, "Israel's farming success drains it of water", The New York Times, 21 April 1991, p. Y-7; and Robert Rehinhold, "New age for western water policy: less for the farm, more for the city", The New York Times, 11 October 1992.

15/ Richard Conniff, "California: desert in disguise" in Water: The Power, Promise and Turmoil of North America's Fresh Water, special ed. (Washington, D.C., 1993), p. 49.

16/ Marcus Amy Dockser, "Israeli scientists search for a solution to water crisis, pivotal in peace talks", Wall Street Journal, 16 November 1992, p. A 10; and Salameh Elias, quoted by Vesiling J. Pritt in "The Middle East Water: critical resource", National Geographic (Washington, D.C.), May 1993, p. 59.

17/ Natural Resources Defense Council v. Duvall, United States District Court, E.D. California (777 F.Supp. 1533, E.D.Cal 1991); and "Federal judge

orders review of rules on irrigation water", The New York Times, 1 August 1991, p. A 14.

18/ Beck, op. cit., vol. 2, p. 234.

19/ Ibid.

20/ Bonnie G. Colby et al., "Water rights transactions: market values and price dispersion" in Water Resources Research, vol. 29., No. 6 (June 1993), pp. 1565-1572.

21/ Helen M. Ingram et al., "The trust doctrine and community values in water", paper presented at the Third World Conference on Water Law and Administration, Alicante-Valencia, Spain, 1989, p. 10.

22/ Ibid., p. 11.

23/ Bauer, op. cit., p. 1.

24/ Bauer, op. cit., p. 3.

25/ World Bank, The World Bank and the Environment: First Annual Report (Washington, D.C., 1990), pp. 42-44.

26/ World Bank, "Water resources management", World Bank Policy Paper (Washington, D.C. 1993), p. 45; and Government of the United States of America, National Water Commission, Water Resources Planning (United States Department of Commerce, Springfield, Virginia, 1972).

27/ Beck, op. cit., vol. 6, "State Surveys".

28/ Government of Canada, Environmental Conservation Service, "Major Water-related Legislation and Institutions in Canada", paper prepared for the Committee on Natural Resources of the Economic and Social Council (October 1993), p. 20.

29/ Government of Oman, Ministry of Information, Oman '90 (1990), p. 115.

30/ Mohammed Al-Eryani, "Policy and institutional aspects of water resources management and development in Yemen", in Water Resources in the Middle East: Policy and Institutional Aspects (Urbana, Illinois, 1993), p. 159.

31/ Government of Israel, "The environment in Israel", national report submitted to the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992, pp. 6 and 119.

32/ Barraque, op. cit., p. 7.

33/ Ke Lidan, Water Resources Administration in China and Water Law of the People's Republic of China (1988).

34/ See "Water Management in the Netherlands ..."; and Barraque, op. cit., p. 16.

35/ Government of Brazil, Law Proposal No. 2249-A, 1991, and substitutive, June 1993.

36/ The Water Share Offers: Prospectus, Offers for Share (London, Schoeders, on behalf of the Secretary of State for the Environment and the Secretary of State for Wales, 1989), pp. 1-89.

37/ New York Consolidated Laws Service, cumulative suppl., vol. 26 (December 1992), pp. 75-82.

38/ Water Resources Council, "Proposed Principles and Standards for Planning Water Management and Related Natural Resources", Federal Register (Washington, D.C.), vol. 36, No. 245 (21 December 1971), pp. 24145-24146.

39/ Economic Commission for Europe, "Policies and systems of environmental impact assessment", Environmental Series, No. 4 (ECE/ENVWA/15), p. 39.

40/ Ibid., p. 43.

41/ Ibid., p. 9.

42/ Ibid., p. 28.